

## **North American Drought Monitor– December 2007**

**UNITED STATES:** December was a much warmer than average month in the Southeast region of the contiguous U.S., while cooler than average temperatures stretched from the Upper Midwest to the Southwest. Eight states from Florida to Louisiana and North Carolina had one of their top 10 warmest Decembers on record. Above average temperatures also stretched into the mid-Atlantic and as far west as Texas. Elsewhere, monthly temperatures were near average from the Pacific Northwest to North Dakota and in much of the Midwest and Northeast. New England was near average to cooler than average, and the winter began with heavier than normal snowfall in many areas. By 17 December more snow had fallen in Boston, Massachusetts (19.6 inches/49.8 cm) than fell during all of the 2006-07 snow season (17.1 inches/43.4 cm). On the other side of the country in the Pacific Northwest, precipitation was above to much above average due in part to a powerful storm that struck the region in early December. Heavy rain and wind gusts greater than 100 mph caused widespread damage and the worst flooding in more than a decade in parts of western Oregon and Washington. Many locations received more than 10 inches of rainfall during the first three days of the month.

For the nation as a whole, December precipitation was above average. It was the 18th wettest December since national records began in 1895. Thirty-seven states were wetter, or much wetter than average, while only Texas, Louisiana, Mississippi, and North Dakota were drier than average. However, there was little overall change in the coverage of moderate (D1) to exceptional (D4) drought for the nation as a whole. During the first week of December, 36% of the contiguous U.S. was in moderate to exceptional drought, and at the start of 2008, moderate to exceptional drought coverage was 35%. More than three-fourths of the Southeast and half of the West remained in some stage of drought.

In areas of the Southeast from southern Alabama to North Carolina above average precipitation led to improvement from exceptional (D4) to extreme (D3) drought. There was a reduction of D4 coverage for the region from 31.5% during the first week of December to 22% as the new year began. There were also reductions in drought severity in the mid-Atlantic and Northeast, where moderate drought (D1) was ameliorated in some areas. During the first week of December, D1 conditions covered 65% of the state of Maryland, falling to 36% by the 1<sup>st</sup> of January. In the small Northeast state of Connecticut, D1 drought in 54% of the state was replaced by abnormally dry (D0) conditions.

In the southern state of Texas, conditions deteriorated due to a continuation of below average precipitation in December. After its wettest summer (June-August) on record and a near average September, the last three months of the year were drier than average. For the October-December period, precipitation for the state as a whole was 55% of average, and the three-month period was the 11<sup>th</sup> driest on record. Southern areas of the state were the most anomalously dry in December, with areas along the U.S.-Mexico border the driest in the 113-year period of record. The persistence of below average precipitation led to the introduction of moderate drought (D1) conditions in extreme southern Texas and in bordering areas of the Mexican states of Tamaulipas and Nuevo Leon.

**MEXICO:** In December precipitation for the nation as a whole was 15.1 mm(0.6 in), 54% of the month's average (28.2 mm or 1.12 in). Mexico's National Meteorological Service ranked December 2007 as the 10<sup>th</sup> driest on record for the period 1941-2007.

Precipitation was a result of the passing of eight cold fronts, some transitory low pressure systems as well as the influence of jet streams. The states that received the heaviest precipitation were Chihuahua with 82.3% above normal and Sinaloa (3.6%).

All other states had values below average. The driest were: Nayarit 0.01%, Aguascalientes 4.0%, Zacatecas 5.7%, Coahuila 6.1%, Morelos 13.9%, Queretaro 14.5%, Yucatan 14.9%, Tamaulipas 16.4%, San Luis Potosí 18.2% and Chiapas 19.3%.

Drought conditions D2 continued in the northwest of Sonora and north of the Baja California peninsula. In the central region of the peninsula, drought increased to D1. However, in the extreme southern tip of the peninsula conditions improved from D1 to D0. This was a result of rainfall received during the passing of cold front No. 11 and of the second winter storm of December. Rainfall that improved conditions in the south was not sufficient to reduce precipitation deficits that have persisted for several months in the rest of the peninsula.

In the north of the country, abnormally dry conditions (D0) expanded over Coahuila while in the south of Sonora and north of Sinaloa conditions improved because of the previously mentioned winter precipitation.

Moderate drought conditions (D1) remained in the south of Chihuahua, south of Sinaloa, Nayarit, Zacatecas, Jalisco and north of Michoacan. In Durango, D1 conditions expanded to the north and northeast of the state. Severe drought condition (D2) remained in the same areas of Durango, Jalisco and Michoacan.

In the north and east of Tamaulipas and north of Nuevo Leon, abnormally dry (D0) conditions deteriorated to moderate drought (D1) due to a lack of rainfall during the month.

In the southeast of the country, particularly in the south and west of Chiapas, drought conditions showed no change.

In the Yucatan peninsula, the lack of rainfall in the region led to the expansion of areas with drought D0, D1 and D2 by contrast with November, when drought was less severe.

CONAFOR (Mexico's National Forest Commission), reported 28 forest fires affecting an area of 145 ha (358 acres). Most of the affected vegetation corresponded to areas mostly covered by grasses, shrubs, scrubs, and to a lesser extent the wooded areas. The states affected were Baja California, Coahuila, Veracruz, Jalisco and Distrito Federal.

With regard to reservoir levels, CONAGUA (Mexico's National Water Commission) reported that the volume of reserves in practically all the northwest region increased from 72.8% to 75.9%. In the central-north there was the same tendency, but the absolute value was not significant: 71.3% to 71.5%.

By contrast, in northeast, central and southern regions volumes fell an average of 3.2% compared to November. Nationally, however, storage volume increased from 73.0% to 73.6%. This is an improvement over conditions observed in the same period during 2005 and 2006, when the values were 63.5% and 68.7% respectively.

**CANADA:** Drought conditions throughout most of Canada continue to improve with the exception of Alberta. Alberta continues to receive far below normal precipitation and limited snow cover over southern and central regions. Largest precipitation amounts were recorded on the East and west coasts with some regions receiving up to 250 mm (10 inches). Temperatures were near normal throughout Canada with the exception of Atlantic Canada, and parts of north central Alberta and northern British Columbia, where temperatures were slightly below normal.

There was slight improvement in drought conditions across the southern Prairies and British Columbia. The drought extent was reduced significantly in British Columbia due to above normal precipitation in the central interior.

The prairies remained relatively consistent with some degradation in southern Alberta, Western Manitoba and a small region of Southern Saskatchewan. Below normal fall and winter precipitation in western Manitoba has resulted in an expansion of the drought extent. Lack of water in southern regions of Saskatchewan has resulted in cattle producers hauling and pumping water to meet their operational demands and thus has been classified as a D1.

In Alberta, the northern region improved as much of the region saw 30-40 mm (1.18-1.57 inches) in December. The spring topsoil conditions remain a concern for north central and southern regions due to low precipitation (less than 11mm (0.43 inches) over the last two months) and extremely low snow cover in much of the southern region. Although the region doesn't experience the majority of its winter precipitation until February, above average precipitation will be needed throughout the rest of the winter in order to avoid a large deficit heading into the spring.

Ontario continues to see significant improvements in the drought regions due to average to above average precipitation over the last few months. Although some regions have received upwards of 300 mm (11.8 inches) over the last 3 months, they still are classified as a D0-D2 drought due to the long term water deficits, low lake levels and low stream flows which the area experienced throughout much of this past growing season. Levels of Lake Superior, Michigan and Huron fell by 5-6cm. This represents a slight improvement for Lake Superior and a significant decline for Lake Michigan and Huron from this time last year. These three Great Lakes are below normal lake levels and

continue to be a concern. The region bordering Ontario and Quebec has been upgraded to a D1 condition due to upwards of 70mm (2.76 inches) received in the last month.

**Acknowledgements:**

We acknowledge and thank the following organizations whose reports and assessments are consulted to produce the Canadian portion of the North American Drought Monitor:

AAFC-PFRA District and Regional Offices  
Alberta Environment  
Alberta Agriculture, Food and Rural Development  
B.C Ministry of Environment – River Forecast Centre  
Environment Canada  
Manitoba Hydrologic Forecast Centre  
Natural Resources Canada – Canadian Forest Service  
Ontario Ministry of Natural Resources – Low Water Response  
Saskatchewan Agriculture, Food and Rural Revitalization  
Saskatchewan Watershed Authority